UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,729	10/19/2004	Masaharu Ushihara	MEIC:177	2577

7590 07/14/2005

Parkhurst & Wendel
Suite 210
1421 Prince Street
Alexandria, VA 22314-2805

EXAMINER	
AURORA, REENA	
ART UNIT	**PAPER NUMBER**
2862	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/511,729	USHIHARA ET AL.	
	Examiner	Art Unit	
	Reena Aurora	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/19/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1 – 9 are presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 - 5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onishi et al. (6,909,282) in view of Okumura et al. (JP 2001-165609).

As to claim 1, Onishi et al. (hereinafter Onishi) discloses a rotation angle detector comprising a main rotator (11, fig. 6); a first detecting rotator (12) having a contact with the main rotator (11), the first detecting rotator (12) rotating faster than the main rotator (the diameter of the main rotator is larger than the diameter of the first detecting rotator, therefore the first detecting rotator will rotate faster than the main rotator); a first magnet (13) disposed at a center of the first detecting rotator (12); a first magnetic detector (15) disposed adjacent to a surface opposite to the first magnet (13) (col. 5, lines 8 - 11); a second detecting rotator (31) having a contact with the first detecting rotator (12), the second detecting rotator (31) differently rotating in speed from the first detecting rotator (12) (since both first and second detecting rotators have different number of teeth and therefore they both would have a rotating speed different from each other, Note col. 5, lines 14 - 15); a second magnet (32) disposed at a center of the second detecting

rotator (31) and a second magnetic detector (33) disposed adjacent to a surface opposite to the second magnet (32). Onishi fails to discloses a ferromagnetic body disposed so as to encircle at least any one of the first magnet, the second magnet, the first magnetic detector, and the second magnetic detector. Okumura et al. (hereinafter Okumura) discloses an angle sensor wherein a ferromagnetic body (70, fig. 1 and 2) is disposed so as to encircle a magnetic detector (H2, fig. 1) as a magnetic shielding member such that it shields the magnetic detector from fields other than the field which the magnet near that sensor generates. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Onishi in view of the teachings of Okumura which teaches the concept of shielding the sensor from external magnetic field such that encircling the second magnetic detector of Onishi with a ferromagnetic body would properly shield the second magnetic detector from the external magnetic fields other than second magnet to provide an accurate rotation angle.

As to claim 2, Onishi discloses that each of the first magnetic detector (15) and the second magnetic detector (33) has an anisotropic magnetic resistance element (col. 2, lines 44 - 47).

As to claim 3, Onishi does not explicitly disclose that the ferromagnetic body is incorporated in any one of the first detecting rotator and the second detecting rotator. Okumura discloses a ferromagnetic body (70, fig. 1 and 2) incorporated in a detecting rotator (13) (since the ferromagnetic body is around the sensor which is a part of the detecting rotator). Therefore it would have been obvious to one of ordinary skill in the

art at the time the invention was made to have modified the device of Onishi in view of the teachings of Okumura such that incorporating a ferromagnetic body in a detecting rotator to make a compact device providing an accurate rotation angle such that the ferromagnetic body is shielding the sensor from external magnetic fields.

As to claim 4, Onishi fails to disclose that the ferromagnetic body is incorporated in any one of the first magnetic detector and the second magnetic detector. Okumura discloses an angle sensor wherein a ferromagnetic body (70, fig. 1 and 2) is incorporated in the magnetic detector (H2, fig. 1, 2) as a magnetic shielding member such that it shields the magnetic detector from fields other than the field, which the magnet near the sensor generates. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Onishi in view of the teachings of Okumura which teaches the concept of shielding the sensor from external magnetic field such that incorporating the second magnetic detector of Onishi with a ferromagnetic body would properly shield the second magnetic detector from the external magnetic fields other than second magnet to provide an accurate rotation angle.

As to claim 5, Onishi fails to disclose that the ferromagnetic body is any one of a first ferromagnetic body and a second ferromagnetic body, and the first ferromagnetic body is incorporated in any one of the first detecting rotator and the first magnetic detector; the second ferromagnetic body is incorporated in any one of the second detecting rotator and the second magnetic detector. Okumura discloses an angle sensor wherein a ferromagnetic body (70, fig. 1 and 2) is incorporated in a magnetic

detector (H2, fig. 1) as a magnetic shielding member such that it shields the magnetic detector from fields other than the field, which the magnet near the sensor generates. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Onishi in view of the teachings of Okumura which teaches the concept of shielding the sensor from external magnetic field such that incorporating the second magnetic detector of Onishi with a ferromagnetic body would properly shield the second magnetic detector from the external magnetic fields other than second magnet to provide an accurate rotation angle (The rejection for this claim is made in view of alternative language).

As to claim 8, Onishi discloses a calculator (23, fig. 3) for calculating a rotation angle of the main rotator (11) according to output from the first magnetic detector (12) and the second magnetic detector (31).

As to claim 9, Onishi discloses that the calculator (part of control unit 23) (23B, fig. 3) calculates the rotation angle of the main rotator from phase difference in output between the first magnetic detector (15) and the second magnetic detector (33) (col. 4, lines 25 - 33).

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onishi et al. (6,909,282) in view of Okumura et al. (JP 2001-165609) as applied to claim 1 above, and further in view of Bergstedt et al. (5,602,472).

As to claims 6 and 7, Onishi and Okumura do not explicitly disclose that the ferromagnetic body is made of a ring shaped iron plate or pieces arranged in the form of a ring (as in claim 7). Bergstedt et al. (hereinafter Bergstedt) discloses a device for

determining an angular position of a rotatable member including a ferromagnetic body made of a ring shaped iron plate as a shield (84, fig. 6) to optimize sensor performance. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Onishi in view of the teachings of Okumura and further in view of the teachings of Bergstedt to provide a ring shaped iron plate around the sensor or pieces arranged in the form of a ring (claim 7) to completely shield the sensor from external magnetic fields. The shape of the shield and the material of the shield is selected such that it provide optimize sensor performance in the magnetic environment of the particular application (col. 7, lines 11 – 23, Bergstedt)

Prior Art of Record

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shimizu et al. (6,861,837) is cited for its disclosure of a rotation angle detector.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reena Aurora whose telephone number is 571-272-2263. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, E. Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Reena Aurora
Examiner